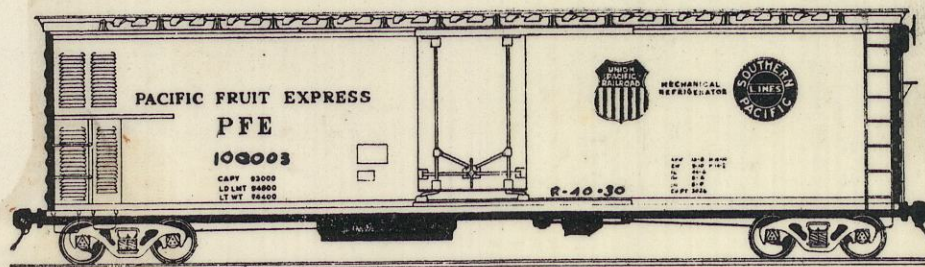


SPECIFICATION NO. 76
FOR
PACIFIC FRUIT EXPRESS COMPANY
80,000 LB. CAPACITY STEEL SHEATHED,
REFRIGERATOR CAR
CLASS R-40-30
WITH
DIESEL-ELECTRIC MECHANICAL REFRIGERATION



Office of Gen. Supt. Car Dept.,
Pacific Fruit Express Company,
San Francisco, California.

July 1, 1957

R-40-30

GENERAL DESCRIPTION

DIMENSIONS:

Gauge.....	4'-8-1/2"
Length over corrugations on steel ends.....	42'-2-31/32"
Inside length.....	35'-3-3/8"
Width inside of lining.....	8'-3"
Inside height from floor rack.....	8'-2-5/16"
Available loading height.....	8'-2-5/16"
Cubic loading capacity.....	2384 Cu. Ft.
Length over end sills.....	41'-8-3/8"
Length over strikers.....	42'-8-3/4"
Length over pulling face of couplers.....	45'-4-1/2"
Width over side sills.....	9'-7-1/2"
Width over side plates.....	9'-8-1/4"
Width over sheathing.....	9'-7-3/4"
Extreme width.....	10'-3-1/4"
Distance center to center of body bolsters.....	31'-8-3/4"
Truck wheel base.....	5'-6"
Total wheel base.....	37'-2-3/4"
Height top of rails to center of couplers.....	34'-1/2"
Height of side door opening (from floor rack)....	8'-0"
Width of side door opening.....	6'-0"
Height top of rails to top of running board.....	
Light weight of each (complete).....	(Est.) 62,800 Lbs.
Refrigerator capacity (P.F.E. Schedule RE-2).....	42,000 BTU/Hr.
Horsepower - (Diesel Engine).....	18 to 25
Kilowatts - Generator.....	12 to 15
Fuel capacity.....	500 Gal.

GENERAL SPECIFICATIONS

REFERENCES:

Railroad Company's specifications for freight car materials and paints are bound under separate cover and latest AAR specifications where applicable are referred to under material specification list.

West Coast Lumbermen's Association lumber specification will apply as specified.

DRAWINGS & SPECIFICATIONS:

All drawings mentioned herein together with any other drawings and separate specifications furnished or specified by the Pacific Fruit Express Company form part of this specification. They must be regarded as a whole, and parts referred to in one and not in the other must be considered as appearing in both.

The Car Builder may submit as an alternate any change or improvement in design comparable with the Railroad Company's design that is justified economically.

Car Builder will promptly notify Railroad Company of any necessary corrections in quantity of material or items specified in specification or schedules if change in design of car or details require such correction.

CLEARANCES:

Limiting dimensions must conform to AAR Limiting Outline, Plate B, latest revision.

INSPECTION:

The Railroad Company reserves the right to place as many inspectors as may be deemed necessary at the Builder's Works, who are to have free access at all times to all drawings and work, that they may see that the provisions of this specification are complied with in every respect.

Material and details not conforming to specifications will be rejected and must be replaced by the Car Builder.

WORKMANSHIP & MATERIAL:

All material and workmanship must be of the best quality, and work accurately fitted to gauges and templates to insure thorough interchangeability.

PATENTS:

The Car Builder must guarantee the Railroad Company against loss through suits, royalties or claims of any kind whatsoever, on patented articles, materials or design furnished by the Car Builder.

CASTINGS:

Castings must carry in raised letters and figures the Railroad Company's pattern number as indicated on drawings.

SCREW THREADS, BOLT HEADS & NUTS:

Screw threads for car construction must be in accordance with Coarse Thread Series Class 2 Fit, of the American Standard for Screw Threads, ASA No. B 1.1 (latest issue).

Screw threads for the mechanical refrigeration unit to be as specified.

Approved lock nuts are to be used where specified.

RIVETING:

Riveting must be done in a workmanlike manner in every respect. Rivets must be centrally headed, tightly driven and entirely fill the holes.

Rivets must be in accordance with AAR Specification M-110 (latest revision) and of sizes as shown on drawings.

Rivet holes through center sills and for parts riveted to center sills must be punched to exact size of rivet and reamed $1/16$ " larger than the diameter of the rivet except where otherwise specified on drawings. The holes must register and rivets must have full bearing through each part. All other rivet holes in car must register and have full bearing all around for the rivet.

All rivets to be driven by machine wherever possible.

If necessary to ream the holes more than $1/16$ " larger, the size of rivets must be increased proportionally.

Flanging of sheets must be true to shape and provide close contact with contiguous parts.

The use of drift pins more than $1/16$ " larger in diameter than rivets will not be permitted. All parts must be securely and tightly clamped together before riveting and in no case

RIVETING: (Cont'd)

shall the rivets be depended upon to draw the parts together. Rivets, after they are driven, shall entirely fill the holes and shall have heads of the proper shape fitting tightly against the sheets or castings.

WELDING:

Welding shall be done by the fusion process and conform to the A.S.T.M. and A.A.R. welding codes.

All welding in car construction must be performed by certified welders.

All slag or flux to be removed with steel brush or by sand-blasting before car structure is painted.

LUMBER:

Douglas fir lumber, in accordance with W.C.L.A. grading rules, will be used in construction of cars and car builder will order all lumber direct as outlined in exhibit accompanying request for quotation on cars.

All lumber must be well seasoned, conforming in dimensions to drawings. Moisture content to be as per AAR requirements, when applied to car.

PLYWOOD:

All plywood must be hot pressed with a cresol formaldehyde synthetic resin binder, tempered, rezited at mill and conform to Specification CS-107. Panels to be fabricated in accordance with drawings.

ROLLER BEARINGS:

Must be of type specified for use with 50 ton axles.

REFRIGERATION:

Each car is to be provided with a Diesel powered electric driven mechanical refrigeration system in accordance with PFE Schedule RE-2.

System is to be located in "A" end of car and provided with control system, fuel system and other necessary appurtenances as shown on drawings.

LUBRICATING TRUCK CENTER PLATE:

Each truck center plate must be supplied with 4 ozs. of approved center plate grease approximately 1/8" thick on entire surface of bottom and a thin coat on sides.

GALVANIZING:

All metal parts of evaporator compartment structural members, including bolts, nuts, washers and screws, and all metal parts on inside of car, must be well galvanized, with commercially pure spelter, not less than 95% zinc. The hot dip process to be used on all parts except bolts, nuts, washers and screws, for which the electro-plating process may be used, in accordance with ASTM Spec. A-164-40T, giving a zinc coating not less than 0.0005" thick.

All material must be thoroughly cleaned and be free from all grease, scale or rust, before galvanizing.

GENERAL INSTRUCTIONS:

Car to be built in accordance with general design and underframe drawings and other drawings furnished by Pacific Fruit Express Company. Underframe to be of welded construction and superstructure to be riveted construction with welding to be used as specified. Safety appliances to be applied as shown on drawings.

In cases where material is lost or spoiled in builder's shop, builder should handle direct with specialty manufacturer all correspondence and bills in connection with replacement without involving the Railroad Company.

TESTS:

The mechanical refrigeration unit in each car must pass a 24 hour test run to the satisfaction of Pacific Fruit Express Company engineers before being accepted.

SUMMARY:

Cars must be built in the best most substantial and workmanlike manner, according to the true intent and meaning of the specifications, notwithstanding that everything required is not particularly mentioned in this specification.

MATERIAL SPECIFICATIONS:

The latest revision of the following material specifications form a part of this specification, viz:

CS-28-A	Linseed Oil, boiled
CS-30	Turpentine
PFE-100	Cattle Hair Insulation
PFE-102	Textile Glass Fiber Insulation
PFE-105	Mineral Wool
PFE-107	Foamed Rubber Hardboard Insulation
PFE-108	Rigid Foamed Plastic
PFE-109	Milti-Air Layer Insulation
PFE-110	Laminated Panel Insulation
PFE-111	Glass Wool Insulation
PFE-113	Fiber Board Insulation
PFE-200	Insulation Paper
PFE-201	Reflective Insulation Paper
PFE-300	Pressed Wood Hardboard
PFE-700	Rubber Cement
CS-107	Douglas Fir Plywood
AAR-D-39	Roller Bearing
AAR-M-101	Axles, Carbon Steel
AAR-M-110	Rivet Steel and Rivets
AAR-M-111	Pipe, Steel
AAR-M-112	Steel Bars, Carbon, for Railway Springs
AAR-M-114	Springs, Carbon Steel, Helical
AAR-M-116	Grade B, Steel-Structural, Shapes, Plates and Bars, Grade C, Pressed Steel Plates
AAR-M-117	Steel Sheets and Thin Plates
AAR-M-119	Galvanized Sheets
AAR-M-122	Mild Steel Bars
AAR-M-126	Class A-B, Forgings-Carbon Steel
AAR-M-201	Steel Castings
AAR-M-202	Truck Bolster, Design Test Requirements
AAR-M-203	Truck Side Frames, Cast Steel, Design Test Requirements
AAR-M-204	For purchase and acceptance of AAR Standard "E" Couplers, Knuckles, Locks and other parts.
AAR-M-205	Coupler Yokes, Design Test Requirements
AAR-M-301	Iron and Steel Chain
AAR-M-402	Malleable Iron Castings
AAR-M-601	Hose, Air Brake
AAR-M-602	Gaskets, Air Brake Hose
AAR-M-901A	Approved Rubber Draft Gears for Freight Service
AAR-M-907	Lumber-Moisture Content
WCLA(Latest Issue)	Lumber-Grading
SPA (Latest Issue)	Lumber-Grading
ASTM A-164-40T	Electro-Deposited Castings for Bolts, Nuts, Washers and Screws
	Paint - Approved List

PFE-400	Zinc Chromate Primer
PFE-401	Galvanized Surface Conditioner
PFE-402	Aluminum Paint
PFE-403	Synthetic Enamel - Red
PFE-404	Synthetic Enamel - Black
PFE-405	Interior Synthetic Varnish
PFE-406	Wood Primer
PFE-407	Light Orange Synthetic Enamel - Undercoats
PFE-408	Light Orange Synthetic Enamel - Finish Coat
PFE-409	Asphalt Coating
PFE-410	Asphalt Floor Coating
PFE-411	Asphalt Roof Coating
PFE-412	Grey Enamel
PFE-414	Thinners for Paints & Varnish
PFE-415	Asphalt Coating - Fibrated
PFE-416	Aluminum Paint - Asphalt Base
PFE-417	Asphalt Roof Coating - Cold Weather
PFE-418	Asphalt Coating - Fibrated - Cold Weather
PFE-419	Galvanized Metal Primer
PFE-420	Primer - Hot Spray
PFE-421	Orange Enamel - Hot Spray
PFE-422	White Stencil Paint
PFE-423	Black Stencil Paint
PFE-424	Red Chromate Lap Joint Point
PFE-425	Wood Preservative
PFE-426	Exterior Gray Paint.

SPECIALTIES:

Manufacturer of material or devices designated as "Specialties" are listed alphabetically and not in order of preference.

Car Builder will furnish and apply to car all items of material designated as "Specialties" and will be required to order direct from manufacturer or vendor all such items of specialties as will be selected by railroad company only after receipt from railroad company of formal authorization. All materials not mentioned which are necessary for application of the different specialties as may be selected by railroad company must be furnished by the Car Builder.

SPECIALTIES TO BE FURNISHED AND APPLIED BY CAR BUILDER

<u>Specialties</u>	<u>Manufacturer</u>
AB Air Brake Equipment with Cast Metal Reservoir	New York Air Brake Company Westinghouse Air Brake Company
Aluminum Sheets & Extrusions	Aluminum Company of America Kaiser Aluminum Reynolds Aluminum
Axles, AAR	Bethlehem Steel Company Carnegie-Illinois Steel Corp. Standard Forgings Company
Batteries	Brittania Batteries Nickel Cadmium Battery Inc. Nife Incorporated Sonotone Corporation Voltabloc Corporation
Bearings, Roller	Hyatt Roller Bearing Company Timkin Roller Bearing Company
Bolster Center Filler	Allied Steel Castings Company American Steel Foundries Buckeye Steel Castings Company McConway & Torley Scullin Steel Company Symington-Gould Corporation
Brake Beams-Unit	American Steel Foundries Apex Railway Products Company Buffalo Brake Beam Company Chicago Malleable Castings Co. Chicago Railway Equipment Co. Davis Brake Beam Company Unit Truck Company
Brake Lever Connection	Pittsburgh Forgings Company Schaefer Equipment Company

Brake Pipe Anchors

Central Railway Supply Company
Gustin-Bacon Manufacturing Co.
Railway Devices Company
T-Z Railway Equipment Company
Universal Railway Devices Co.

Brake Shoes - Duplane

American Brake Shoe Company

Brake Shoe Keys

American Brake Shoe Company
(Lockey)

Brake Rod Jaws

Pittsburgh Forgings Company
Schaefer Equipment Company

Brake Rod Eyes

Pittsburgh Forgings Company
Schaefer Equipment Company

Brake Slack Adjuster (Manual)

Universal Railway Devices Co.

Bulkhead Reinforcements

Consolidated Engineers
Consolidated Western
Equipment Specialties Division
Gar Wood Industries
Independent Iron Works
Kuhl Manufacturing Company
Kyle & Company

Center Plates, Body (Drop-Forged)

ACF Industries
American Locomotive
Pacific Car & Foundry Company
Pittsburgh Forgings Company
Standard Forgings Company

Coupler Centering Device

Standard Railway Equipment Co.

Couplers, AAR Type "E" Cast Steel,
Grade B, (Rigid Shank)

American Steel Foundries
Buckeye Steel Castings Company
McConway Torley Corporation
Nat'l. Mall. & Steel Castings
Symington-Gould Corporation

Coupler Release Rigging-Rotary

Standard Railway Equipment Co.

Coupler Yokes, AAR, Cast Steel,
Grade B, (Rigid Type)

Allied Steel Castings Company
American Steel Foundries
Buckeye Steel Castings Company
McConway Torley Corporation
Nat'l. Mall. & Steel Cstgs. Co.
Scullin Steel Company
Symington-Gould Corporation

Cotter Keys Lock-Tite

Gustin-Bacon Manufacturing Co.

Cylinder and Floating Levers

Defect Card Holders

Door Seal

Doors, Machine Compartment

Doors, Steel (Sliding)

Draft Key Retainer & Lock

Draft Gear - Rubber

Ends - Steel

Air Grilles

Front Draft Gear Stops

Fuel Tanks

Fuel Tank Fittings

Fuel Tank Gauges

Pittsburgh Forgings Company
Schaefer Equipment Company

Apex Railway Devices Company
Flexi Manufacturing Company

American Rubber & Products, Inc.
Bridgeport Fabrics, Inc.
Camel Sales Company
Equipment Specialties Division
R. L. Landis Industries
Ralphs-Pugh Company
Roll-Rite Corporation
Transit Supply Corporation

Farr Company
Youngstown Steel Door Company

Superior Car Door Company
Youngstown Steel Door Company

Illinois Railway Equipment Co.
Universal Railway Devices Co.
Western Railway Equipment Co.

Nat'l. Mall. & Steel Castings Co.
W. H. Miner, Inc.

Pullman-Standard Car Mfg. Co.
Standard Railway Equipment Co.

Farr Company

Pittsburgh Forgings Company
Standard Forgings Company

Blackwelder Manufacturing Co.
Butler Manufacturing Company
California Steel Products
Consolidated Western
Equipment Spec. Divn. - UA&R Co.
Independent Iron Works
Pelton Water Wheel Company
S. F. Welding & Steel

Buckeye Fill Nozzle Valve Co.
Harman Equipment Company
Paramount Manufacturing Co.
Protectoseal Company

Liquidometer Company
Manning, Maxwell & Moore Co.
Nathan Manufacturing Company

Hand Brakes	Ajax-Consolidated Company Equipment Spec. Divn. - UA&R Co. W. H. Miner, Incorporated National Brake Company Superior Hand Brake Company Universal Railway Devices Co.
Insulation, Walls	American Hair & Felt Company Gustin-Bacon Manufacturing Co. Isoflex Corporation Johns-Manville Sales Corporation Owens-Corning Fiberglas Corp.
Insulation, Roofs	American Hair & Felt Company Gustin-Bacon Manufacturing Co. Isoflex Corporation Johns-Manville Sales Corporation Owens-Corning Fiberglas Corp.
Insulation, Floors	American Hair & Felt Company Dow Chemical Company Isoflex Corporation
Insulation Paper - Reflective	Alfol Insulation Company Glass Kraft, Incorporated Silvercote, Incorporated Sisalkraft Company
Ladders, Side and End	Pittsburgh Forgings Company Wine Railway Appliance Company Yuba Manufacturing Company
Plywood - Douglas Fir	Dant & Russell, Incorporated Harbor Plywood Corporation Long Bell Lumber Company M&M Wood Working Company Smith Wood Products Company U. S. Plywood Company West Coast Plywood Company Weyerhaeuser Sales Wheeler-Osgood Sales Corp.
Pressed Wood	Forest Products, Incorporated Masonite Corporation Simpson Logging Company
Roofs, Solid Steel	Pullman-Standard Car Mfg. Co. Standard Railway Equipment Co.
Running Boards & Brake Steps - Metal	Apex Railway Products Company Blaw-Knox Divn. of Blaw-Knox Co. Morton Manufacturing Company Transportation Specialties Co. U. S. Gypsum Company

Side Bearings, Roller

W. H. Miner, Incorporated
Pettibone Mulliken
Q & C Company
Standard Car Truck Company
A. Stucki Company
Wine Railway Appliance Company

Side Bearing Wear Plate

Pittsburgh Forgings Company
Standard Forgings Company

Side Plates

Standard Railway Equipment Co.

Snubbing Device Parts

American Steel Foundries
Buckeye Steel Castings Company
Holland Company
Nat'l. Mall. & Steel Castings Co.
Scullin Steel Company
Standard Car Truck Company

Springs, Truck

American Locomotive Company
American Steel Foundries
Betts Spring Company
Crucible Steel Company
Henry Miller Spring Mfg. Co.
Union Spring & Mfg. Company

Steel Sheathing & Framing

Consolidated Western Steel Corp.
Pacific Car & Foundry Company
Pullman - Standard Car Mfg. Co.
Youngstown Steel Door Company
Yuba Manufacturing Company

Steel Wheels, A-33

American Brake Shoe Company
American Rolling Mill Company
The Baldwin Locomotive Works
Bethlehem Steel Company
Carnegie-Illinois Steel Company
Edgewater Steel Company
Griffin Wheel Company

Studs, Welding

K.S.M. Company
Nelson Stud Welding

Thermometers, Dial

Liquidometer Corporation
Manning, Maxwell & Moore

Threshold Plate, Door

Johns-Manville Sales Corporation
Oliver Tire & Rubber Company
Transit Supply Corporation

Truck Side Frames

American Steel Foundries
Buckeye Steel Castings Company
Nat'l. Mall. & Steel Castings Co.
Scullin Steel Company
Symington-Gould Corporation

Truck Bolsters

American Steel Foundries
Buckeye Steel Castings Company
Nat'l. Mall. & Steel Castings Co.
Scullin Steel Company
Symington-Gould Corporation

Truck Levers

Pittsburgh Forgings
Schaefer Equipment Company

Underframes

ACF Industries, Incorporated
Consolidated Western Steel Corp.
Gate City Steel Works, Inc.
Gunderson Bros. Engr. Corp.
Independent Iron Works
Kaiser Steel Fab. Division
Pacific Car & Foundry Company
Pullman-Standard Car Mfg. Co.
Yuba Manufacturing Company

Underframe Ends - Cast Steel

Buckeye Steel Castings Co.
General Steel Castings Co.

Units, Mechanical Refrigerating

Carrier Corporation
Electro-Motive Division, GMC
Equipment Specialties Divn. UA&R Co.
Trane Company

Washers - (Special Lock)

MacLean-Fogg Lock Nut Company

Wear Plates, Unit

American Steel Foundries
Apex Railway Products Company
Buffalo Brake Beam Company
Chicago Malleable Castings Co.
Chicago Railway Equipment Co.
Davis Brake Beam Company
Flannery Manufacturing Company
Pittsburgh Forgings Company
Unit Truck Corporation

Lading Strap Anchors

Keystone Manufacturing Company
MacLean-Fogg Lock Nut Company
Stran Steel Corporation

DETAIL SPECIFICATION

TRUCKS

TYPE:

Trucks to be of the spring plankless roller bearing type with built in snubbing device, meeting all AAR requirements and limiting dimensions.

Side frames to be of Grade "B" cast steel with inverted tension member and adaptable to type of built-in snubbing arrangement specified.

Side frames must be marked by the five button method for indicating wheel base variation from normal. In the assembly of trucks, side frames with like number of buttons to be assembled in the same truck; however, a tolerance of one button in the frames paired in one truck will be permissible.

Truck bolsters must be of Grade "B" cast steel and must meet all AAR requirements and be adaptable to type of built-in snubbing arrangement specified.

All trucks to be designed for 3-11/16" total spring travel.

Wheels and axles must be in accordance with latest AAR requirements.

GAUGING:

Gauges must be used to assure correct dimensions within specified tolerances of bolster ends at truck side column guides and correct length of bolsters from center plate to column guides. Bolster center plates must be gauged and carefully checked to see that all inside surfaces are smooth to assure correct bearing and fit with top center plates. Truck sides and bolsters must be carefully matched to avoid assembly of truck sides having minimum dimensions with truck bolsters having maximum dimensions. Manufacturer to furnish Railroad Company's inspector with necessary gauges.

DIMENSIONS:

Wheel Base.....	5'-6"
Height top of rail to top of center plate under light car.....	25-3/4"
Height top of rail to top of side bearing under light car.....	29-13/16"

AXLES:

Must be 5-1/2" x 10" AAR Standard in accordance with AAR Specification M-101. Ends of axles must be finished for application of roller bearings.

SPRINGS:

Formation of spring clusters to be as specified by the Railroad Company for the type trucks used. Trucks to be sprung for a nominal capacity of 80,000 lbs.

SIDE BEARINGS:

Side bearing clearance shall be adjusted within the limits of 1/4" per bearing and shall be measured at each bearing with car on straight and level track with car body level.

Total side bearing clearance at BL and AR corners must not vary more than 1/8" from total side bearing clearance at BR and AL corners.

WHEELS:

Wheels will be A-33 design cast steel or one wear wrought steel as may be specified.

Wheels must be mounted on axles at a pressure of not less than 75 tons nor more than 110 tons.

Wheel bore and retundity must be in accordance with AAR Wheel and Axle Manual.

Mounting of wheels must be in strict accordance with AAR practice, recording gauges must be used in connection with wheel mounting presses and the mounting charts from these gauges must be turned over to the Railroad Company's Inspector.

BRAKE SYSTEM

AIR BRAKES:

Must be Type AB-1012 and with an approved type manual slack adjuster. All brake equipment must be securely attached to underframe as shown on brake arrangement drawing. Approved flange fittings must be used throughout.

Each car, before being released, must be tested with a single car testing device in accordance with standard procedure.

BRAKE PINS:

All brake pins must be made of mild steel, turned or drop forged to within 1/64" of sizes shown on drawings and secured by 3/8" Lock-Tite cotter keys except pins at dead lever guides which must be secured with standard cotter keys. All holes for brake pins must be drilled.

ANGLE COCK SUPPORTS:

O. H. steel angle cock supports must be welded to end sills for securing ends of train line pipe and angle cock as shown on drawings.

BRAKING POWER:

Must be 50% with a tolerance of plus 2% minus nothing of light weight of car, based upon 50 lbs. brake cylinder pressure.

BRAKE BEAMS:

Unit brake beams, AAR Approved.

BRAKE PARTS:

Truck brake parts must conform to AAR strength requirements.

TRUCK LEVER CONNECTIONS:

To be as shown on drawings.

TRUCK AND BODY BRAKE LEVERS:

To be as shown on drawings.

BADGE PLATE:

Pressed brass plate or cast badge plate showing brake lever dimensions must be applied to the center sill in a visible location near the air brake cylinder as shown on drawing.

BRAKE SHOES:

Brake shoes with steel back must meet AAR design.

BRAKE SHOE KEYS:

To be as shown on drawings.

BRAKE STEP:

Galvanized metal brake steps must be as shown on drawings and meet AAR requirements.

HAND BRAKE:

Power hand brake to be of the vertical wheel "Non-Spin" type.

Design must have AAR certification.

HOSE:

Hose to be in accordance with AAR specifications.

PIPING:

Extra strong steel pipe and extra heavy fittings must be used for train line, all connections and retainer pipe, except the short nipples on ends of train line which must be standard pipe. All pipe to be as per AAR Specification M-111. All piping must be well secured to underframe of car and applied concentric with holes in diaphragms and bolsters.

Individual pipes must be formed to accurate shape before application. Strain on pipe and flanged unions caused by forcing same in place to obtain connection must be avoided.

Red lead or white lead must not be used on pipe points. Plumbago may be used.

Alternate: Welded type train line connections or as may be specified.

All pipes to be hammered and blown free of dirt before connecting them to valvular mechanism.

BRAKE PIPE ANCHORS:

Brake pipe anchors for train line pipe and retainer pipe to be as shown on drawings.

PISTON TRAVEL:

Must be adjusted to 7" with 50 lb. brake cylinder pressure before cars are released.

RODS & CONNECTIONS:

Connections from truck levers to cylinder and floating levers and between cylinder and floating levers must be provided with forged steel jaws.

Length of rods to be determined by placing cylinder and floating levers at 75° with center line of car with established piston travel, and truck levers at their lowest point of adjustment. Clearance should then be checked with the piston in extreme travel and release positions to see that there is ample clearance for moving parts in the guides, carriers, and any other parts of car or truck. Hand brake should be tested with full push rod travel to assure necessary clearances.

BRAKE SLACK ADJUSTERS:

Manual brake slack adjuster to be provided as shown on drawing.

UNDERFRAME

Underframe to be welded design as shown on drawings and as described in P.F.E. Schedule No. 31. (Copy is attached as a part of this specification)

Underframe drawings cover the general design to be followed. These drawings are not intended to cover all details necessary to fabricate and assemble the underframe. Manufacturer shall prepare any additional detail drawings that may be required for fabricating and assembling the underframe complete.

Underframe must be built in the best, most substantial and workmanlike manner, according to the true intent and meaning of the specifications, notwithstanding that everything required is not particularly mentioned in this specification.

CENTER PINS:

To be made of O.H. steel as shown on drawing.

SIDE SILL ANGLE:

To be 5" x 3" (sheared to 2") x 5/16" angle assembled with steel sheathing and welded to side sill channel with 5" leg vertical. Angle to be chamfered as shown on drawing.

SILL STEPS:

Sill steps to be made of O.H. steel and meet ICC requirements, one secured to each corner of car. The step under each door opening

SILL STEPS:(Cont'd)

and at engine compartment entrance door to be provided as shown on drawing.

CENTERING DEVICE:

Striker to be designed for use with coupler centering device. Trunnion pocket support to be furnished by the Railroad Company and applied by the underframe manufacturer.

DRAFT GEAR POCKET:

Draft gear pocket must be 12 7/8" between center sill webs and longitudinal space of 24 5/8" plus 0" minus 1/16" between front and rear draft lugs.

Front draft lugs must be made of C-1038 drop forged steel and welded to the center sill. Lugs must be heat treated to 250 to 285 Brinell hardness.

DRAFT RIGGING

COUPLERS:

To be bottom operated AAR Type "E" Rigid shank of cast steel Grade "B".

Coupler knuckle and lock to be Grade "C".

Coupler knuckles to be gauged and all rough or uneven faces to be ground off.

Coupler draft key to be open hearth steel, Class C-1045.

COUPLER RELEASE RIGGING:

To be rotary type bottom operating.

COUPLER YOKES:

To be AAR vertical rigid type of cast steel Grade "B".

DRAFT GEARS:

AAR certified friction or AAR approved rubber draft gears and to provide 4" coupler horn clearance as shown on drawing.

DRAFT GEAR CARRIERS:

To be made of 5/8" O.H. steel plate riveted to bottom flanges of center sills as shown on drawing.

DRAFT KEY RETAINER AND LOCK:

Draft key retainer and lock of type as may be specified, secured with a 3/8" rivet as shown on drawing.

FLOOR CONSTRUCTION

FLOORING, STRINGERS AND DECKING NAILERS:

All wood parts are to be Douglas fir.

The entire floor must be built upon wood stringers bolted to underframe, as shown on drawing, with welding studs.

The lower floor is to be made of No. 12 ga. metal sheets secured to underframe by continuous welding, as shown on drawing.

The floor insulation must be applied as described under "Insulation" and as shown on drawing.

MACHINE COMPARTMENT FLOOR:

Floor to consist of 3/8" metal plate welded to underframe.

Floor to be given coat of an approved non-skid material.

DECKING:

Floor must be tongue and groove 1-3/4" x 5-1/16" face and secured to side floor stringers by 30d 6 gauge 4-1/4" long cement coated sinkers, 2 nails in each board in each stringer and to intermediate and center floor stringers by 20d 7 gauge 3-3/8" long cement coated sinkers, one nail in each board at each stringer. Floor boards must be surfaced on both sides well matched and tightly driven, the tongue of one board making a snug fit into the groove of the next.

WATERPROOF FLOOR:

A 2-1/2" x 2-3/4" x 24 Ga. galvanized flashing is to be nailed to decking and coping board with 1" No. 12 barbed galvanized roofing nails spaced approximately 2" O.C. Any

WATERPROOF FLOOR: (Cont'd)

necessary joints in flashing are to be soldered. A 3" x 30 ga. galv. iron strip is to be applied transversely across the car centered under each joint of the waterproof covering to be applied.

A waterproof covering of 3/16" pressed wood board, P.F.E. Spec. 300, is to be applied in panels running transversely across the car and so arranged as to completely cover the floor to within 1/4" of the sub lining walls. Before application of the pressed wood panels a 1/16" thick by 3" wide strip of caulking compound is to be applied on top of the side flashings and transverse metal strips to form water tight joints when the panels are applied.

Pressed wood panels are to be cemented into place with rubber cement, P.F.E. Spec. 700, and laid with the smooth side up with 1/16" space between panels. They are to be nailed in place with 6d No. 13 ga. 1-7/8" long galvanized sinkers spaced 4" on center on the edges and 6" on center each way through the body of the panels. The center is to be nailed first and the edges last.

DRAIN PAN HEATER ASSEMBLY:

A drain pan is to be made of non-ferrous metal and provided with a suitable drain tube as shown on drawings. Heating element to be furnished by supplier of refrigeration system. Complete assembly is to be set into floor pan and secured and located as shown on drawings.

DRAIN PIPE TRAP:

Car is to be provided with four drain pipe traps secured and located as shown on drawings..

DRAIN PIPE TRAP HEATER:

A drain trap heater is to be provided (furnished by supplier of refrigeration system) as shown on drawings.

Heater to be connected as shown on drawings.

FLOOR RACKS:

Floor racks are to be herringbone type with galvanized metal slats and Douglas fir stringers. Racks are to be designed for lift truck operation within the car and slats must support a minimum concentrated load of 1800 lbs. without exceeding the yield point of the material used. Floor rack gate stringers to be

FLOOR RACKS: (Cont'd)

hinged at door openings so that they may be folded back when in raised position. Split bolts to be applied in stringers as shown on drawings.

Floor racks to be assembled in jig with swinging gates made right hand and left hand and all holes for screws bored to prevent splitting of stringers.

Gates to be provided with handhold as shown on drawing.

Racks to be hinged to side of car with cast steel hinges secured as shown on drawings.

All nuts to be pulled up tight and bolts checked.

FLOOR RACK HOLDERS:

To be of design as may be specified.

Holders for floor racks, twelve per car, to be located in side walls as shown on drawing.

Each holder to be backed by a $3/4$ " x 6" vertical furring piece toenailed between belt rails and a $1-27/32$ " x 6" block between sub-lining and main lining. Holders to be secured by $1-3/4$ " #14 galvanized round head wood screws.

FLOOR PAN:

Floor pan is to be made of No. 14 gauge galvanized steel and provided with a suitable drain pipe as shown on drawing.

Front edge of pan is to be set in caulking compound. Pan to be secured with $5/32$ " x $1-3/4$ " galvanized ring shank nails.

SUPERSTRUCTURE

STEEL SIDE SHEATHING & FRAMING:

Shall consist of .10" O.H. steel side sheets applied vertically with lap joints on intermediate posts. Door posts to be $3-3/8$ " x 8.3 lbs. per ft. Z-Bars. Intermediate posts to be $1/4$ " H.T.L.A. steel pressed wing channels. Corner posts to be made of $1/4$ " pressed O. H. steel plate as shown on drawings.

Side plates to be O.H. steel Z-U section 8.05 lbs. per foot.

All rivets $3/8$ " diameter except at top and bottom of all posts and at steel end connection where $1/2$ " rivets are used. All outside

STEEL SIDE SHEATHING & FRAMING: (Cont'd)

lap edges of steel panels to be slightly crimped in line with rivets to insure a tight fit between edge of panel against adjacent sheet. Where handholds are bolted to steel sheathing substantial angle stiffeners must be provided as shown on drawings.

Belt rails and coping boards to be secured to steel posts by welding studs as shown on drawings.

Top side sheet on "AR" side of car to be 14 gauge and must be provided with horizontal louvers as shown on drawing and to be secured with 3/8" rivets. except at steel end where 1/2" rivets are used.

Bottom side sheet on "AR" side of car to be 14 gauge and provided with opening for application of air inlet grill as shown on drawing.

Top side sheet on "AL" side of car to be of 14 gauge O.H. steel and to be provided with louvers running horizontally as shown on drawings.

Steel brackets with welding studs must be provided at door and corner posts for bolting of all belt rails and coping boards as shown on drawings.

MACHINE COMPARTMENT DOOR:

Entrance door to machine compartment must be of the sliding type design and provided with rollers at the bottom. Door must be provided with louvers and suitable locking device.

STEEL ENDS AND ATTACHMENTS:

Steel ends, made in two sections, must be welded together with a continuous weld on the outside and 2" welds on 6" centers on the inside.

Depth of corrugation must be 3" on the "A" end and 4" on the "B" end. Top section of the "B" end must be 3/16" O.H. steel plate and the bottom section 1/4" O.H. steel plate. Top and bottom sections of the "A" end must be made of 5/32" O.H. steel plate. The "B" end must be provided with steel bolting straps complete with welding studs for securing wood members as shown on drawings.

Ladders and handholds on the "B" end to be bolted to steel ends using G-T washers with special flat neck bolts.

Ladders and handholds on the "A" end to be riveted to the steel ends.

STEEL ENDS AND ATTACHMENTS: (Cont'd)

Placard board holders to be secured to steel ends with "Ramset", (or equal). Brake step brackets, brake housing brackets, and running board brackets to be riveted to steel ends.

BULKHEAD FRAMING:

Bulkhead to be constructed of 4" 13 lb. "H" beams with three 2-1/2" x 2-1/2" x 3/8" angles applied horizontally between bulkhead and steel end as shown on drawings.

Support for securing evaporator and blower assembly to be made of galvanized shapes and plates securely welded together as shown on drawing.

BULKHEAD PAD:

Bulkhead pad is to be 1" thick plywood made in two pieces for the "B" end and four pieces for the "A" end as shown on drawings.

Pad in "B" end of car to be nailed to vertical nailers with 1-7/8" long 6d galvanized cement coated sinkers. Panels to be applied horizontally with "groove and spline" joints using No. 12 gauge galvanized steel spline.

MACHINE COMPARTMENT LINING:

Lining to be 12 gauge O.H. steel welded to bulkhead structural framing members as shown on drawing.

Inside of lining to be painted as specified under section covering Painting, Lettering and Numbering.

EVAPORATOR WELL LINING:

Side and end walls to be lined with galvanized iron sheet extending from the drain pan to approximately 2" above the evaporator.

REFRIGERANT CONTROL PANEL COVER:

Refrigerant control panel to be enclosed with a galvanized steel cover as shown on drawing and is to be filled with an approved foam insulating material.

LOCK WASHERS:

Where safety appliances are bolted to steel superstructure they must be secured by means of flat neck bolts fitted into key

LOCK WASHERS: (Cont'd)

slots and bolts locked by GT washers, unless otherwise noted. Each washer to be sealed with 1/16" permagum[®] before application and all bolts are to be riveted over nuts.

BELT RAILS AND COPING BOARDS:

Belt rails to be Douglas fir and extend from door posts to corner posts. Top and intermediate belt rails to be of size as may be specified and secured to steel framing by welding studs as shown on drawings.

Coping boards to be of size as may be specified and extend from door posts to corner posts in one piece, and secured to steel frame by welding studs as shown on drawings.

Belt rails and coping boards to be counterbored for nuts and washers and all bolts to extend to 1/4" from inside face of belt rails.

INSULATION SPACER BLOCKS:

See Insulation - Sides.

DOOR POST:

Door posts to be Douglas fir bolted to door steel Z-Bars with 1/2" bolts and faced with hardwood as shown on drawings.

DOOR OPENING HEADER:

Door opening header to be Douglas fir securely bolted to door header angle with 1/2" bolts.

SUB-LINING - SIDES AND ENDS:

To be 5/16" pressed wood panels of grade specified. Panels applied vertically extending from coping board to ceiling, and between door post and corner post with butt joints. Vertical backing cleats 3/4" thick are to be nailed between belt rails at each joint as shown on drawing. Pressed side wall panels to be nailed to belt rails and coping board with 4d, 14 gauge 1-3/8" long cement coated sinkers spaced about 4" apart.

All joints to be sealed with an approved adhesive sealing tape 1/16" x 1-1/2" at butt joints and 1/16" x 2" at ends and corners.

LINING - ENDS:

End wall panels on "B" end to be nailed to vertical wood posts with 6d, 13 gauge, 1-7/8" long cement coated sinkers spaced about 4" apart.

Plywood panels on "A" end to be secured to bulkhead reinforcements with welding studs and "T" nuts as shown on drawing.

LINING - SIDES:

Side lining to be 25/32" x 3-1/4" T&G Douglas fir applied horizontally and extending from door posts to ends and nailed to vertical nailers as shown on drawing with 8d, 11-1/2 gauge, 2-3/8" cement coated sinkers. Vertical nailers to be securely nailed to belt rails and coping board with 12d, 10 gauge, 3-1/8" long cement coated sinkers. Ends of T&G lining boards to have two nails and one at intermediate nailers.

LADING STRAP ANCHORS:

Lading strap anchors must be of type specified and applied as shown on drawings.

LADDERS & HANDHOLDS:

Side and end ladders must be made as shown on drawings. All safety appliances must meet ICC requirements and AAR rules of interchange, and be located as shown on drawings.

COMMODITY CARDBOARDS:

To be located and secured to sides of car as shown on drawings.

PLACARD CARDBOARDS:

To be secured to ends and sides of car as shown on drawings.

DEFECT CARD HOLDER:

Of type specified, one per car, located as shown on drawing.

SIDE DOORS

DOOR FRAMING:

Each side of car to be equipped with one sliding door as shown on drawing.

Each door must be built up of O.H. steel angles and Douglas fir wood framing, assembled as shown on drawing and covered on the outside with 14 gauge C.B.O.H. steel sheathing.

Inside of doors to have pressed wood sub-lining, vertical stringers and T&G lining of same material as specified for side walls and securely nailed in similar manner as specified for side walls. For location and size of vertical stringers see drawings.

Vertical edges of door sheathing to be flanged over door stiles and vertical edges of lining to be protected by application of hardwood facing strip to be nailed to door stiles and sub-lining as shown on drawing.

Side doors and openings to be made of jigs and templates to insure interchangeability and to be free of air leaks around door opening. It is mandatory that lining of door be exactly flush with car lining when doors are closed.

DOOR FASTENERS:

Door fasteners must be so adjusted that, when operated, doors will be forced tightly against door frame opening. Each door must be provided with door fixture to hold doors when in open position.

All bolts extending through doors must be countersunk into door framing and counterbores filled with loose insulation before applying sub-lining.

DOOR THRESHOLD:

Each side door opening must be provided with a moulded threshold plate cemented in place and further secured to threshold filler and floor with 2" No. 18 galvanized wood screws as shown on drawing.

Douglas fir threshold must be provided at door openings as shown on drawing.

ROOF

ROOF:

Solid steel roof to be made as follows:

Roof sheets and other parts to be of material as listed below:

ROOF: (Continued)

Full Sheets.....	No. 14 gauge O.H. Steel Galv.
End Roof Sheets.....	No. 14 gauge O. H. Steel Glav.
8 Seam Caps.....	1/8" plate C.B. O.H. Steel
Running Board Saddles.....	No. 11 gauge O.H. Steel Galv.
Side Plate Fillers.....	5/16" x 1-1/4" O.H. Steel

All roof joints must be watertight.

Roof structure to be assembled and applied with 3/8" rivets.
Side ladders and roof handholds are to be secured with 5/8" rivets.

Inside of seam caps are to be filled and flanges of roof sheets painted with an approved amstic sealer. Openings at ends of seam caps to be filled with fibrated asphalt, P.F.E. Spec. 415. A 1/16" x 1" strip of permagum is to be used between roof sheets and side plate and between end roof sheet and flange on steel end on "B" end only.

CEILING:

Ceiling to be .040 embossed flat aluminum roofing. Panels to be applied transversely extending between car side wall lining.

Aluminum extrusion to be used at all transverse joints. Panels and extrusions to be secured to ceiling nailers by No. 10 1" long screws to extrusions and No. 10-3/4" screws to panels. All screws to be aluminum with Phillips recessed head.

End panel of ceiling nearest machine compartment must be arranged to permit removal of blower assembly.

Ceiling to be provided with holes and diffusers as shown on drawings.

SUB-CEILING:

Sub-ceiling to be 5/16" pressed wood. Panels to be applied transversely as shown on drawing.

Panels to be nailed to carlines and sub-ceiling nailers with 1-7/8" long 6d cement coated sinkers. All joints to be sealed with 1/16" adhesive sealing tape.

CEILING NAILERS:

Ceiling nailers to be Douglas fir and extend from end wall lining to end wall lining and to be of size as shown on drawing.

Ceiling nailers to be suspended from carlines by means of galvanized hangers. Hangers to be secured to carlines by 1/2" x 6" galvanized bolts spaced 36" centers.

Provision to be made to hinge 24" of end of ceiling nailer nearest machine compartment end wall to facilitate removing blower assembly.

RUNNING BOARD:

Metal running boards must be secured to running board saddles with rivets as shown on drawings. Latitudinal sections to be secured to fastening bars with rivets as shown on drawings. Metal running boards to be galvanized.

INSULATION

FLOOR:

See heading "Underframe" for details of floor construction.

Total floor insulation is to be 6" thick, of type specified and applied as shown on drawings.

SIDES AND ENDS:

See heading "Superstructure" for details of construction of sides and ends.

Wall insulation is to be one 3" outside course of blanket type and one 3" inside course of multi-layer (panel form) insulation applied as shown on drawings. An additional layer of 2" blanket insulation is to be applied in the bulkhead in the "A" end as shown on drawings.

It is important when hanging insulation blankets that care is taken to see that the blankets hang loose between belt rails and that no stretching downward by the weight of the blanket itself is permitted as such stretching will reduce the thickness of blankets in the upper sections.

SIDES AND ENDS: (Cont'd)

For size and application of belt rails, see drawing.

Insulation spacer blocks to be made of plywood and applied as shown on drawing.

After assembly, the inside surfaces of sheathing, steel ends, side plates, side posts, corner posts and bulkhead are to be sprayed with 1/8" thick coat of fibrated asphalt P.F.E. Spec. 415.

Care must be taken to see that all steel surfaces except bearing surfaces at all bolt locations are well covered.

ROOF:

See heading "Roof" for details of roof constructions. Roof insulation is to be one 2" lower course of multi-layer insulation placed between carlines. A 2" intermediate course of blanket type insulation is to be placed on top of the multi-layer panels, and a 4" top course of blanket insulation covered with a course of reflective material as shown on drawings.

SIDE DOORS:

The side doors to be insulated with same kind and thickness of insulating material as specified for sides and ends, applied as shown on drawings.

After wood framing is applied, the inside of steel sheets is to be covered with an approved non-corrosive fire resistant insulating material as specified for steel sheathing.

All visible counterbored holes in wood stiles to be filled with water putty.

DOOR SEAL:

Door seal of approved type to be applied as shown on drawings.

POST FILLERS:

All intermediate side posts must be sprayed inside with an approved asphalt material

BELT RAIL BOLTS:

All counterbored holes for nuts in belt rails and coping boards must be filled with Hairfelt plug or loose hair.

AIR DIFFUSERS:

Air diffusers to be made of aluminum and located in plenum as shown on drawings.

FUEL SYSTEM

FUEL TANK:

Two fuel tanks(250 gal. capacity each) are to be mounted to underframe and located as shown on drawings.

Tanks to be complete with necessary fittings for application of fuel gauge located on "L" side of car. All connections must be located as shown on drawings.

FUEL CONNECTION TANK:

Tank to be located between center sills as shown on drawings.

FUEL LINE CONNECTIONS:

Pipe to consist of 2" diameter fuel filler line complete with filler caps and strainer.

Fuel return and feeder pipes to be 3/4" diameter complete with check valves and necessary couplings and unions.

Vent line to be 3/4" diameter pipe equipped with an approved vent cap.

All piping and fittings must be standard weight and located as shown on drawings.

MISCELLANEOUS

DIAL THERMOMETER:

Car will be provided with one thermometer, having sufficient length of capillary to facilitate application and be located as shown on drawing.

BATTERY:

A 12 volt, heavy duty battery must be provided complete with cables, terminals and lugs.

BATTERY BOX:

A battery box complete with clamps to be furnished and located as shown on drawings.

LUBRICATING OIL:

Crank case must be filled with a heavy duty, SAE 30 grade of detergent type engine oil.

ANTI-FREEZE:

Radiator of power unit to be filled with a mixture of 50% water and 50% anti-freeze (Prestone or equal).

MACHINE COMPARTMENT MISCELLANEOUS EQUIPMENT:

An approved eye shield and holder must be provided and located as shown on drawings.

INSTRUCTION MANUAL HOLDER:

Holder must be provided for the instruction manual and be located as shown on drawing.

LOG BOOK HOLDER:

Log book holder to be located and made as shown on drawings.

PAINTING, LETTERING & NUMBERING

GENERAL:

Paint is to be furnished by Car Builder and must be approved by the Railroad Company for color and quality. Drift control panels of colors will be furnished by the Railroad Company. List of approved paints is furnished with this specification.

Paint to be applied in even coats either by brushing or spraying and must be done in a workmanlike manner.

Paint rollers may be used on interior of car.

When two or more coats are applied, preceding coat must be thoroughly dry before application of next coat.

All metal surfaces must be thoroughly cleaned free of rust, scale, dirt, grease and moisture before being painted. All welds must be thoroughly cleaned of flux and slag before painting.

Paints must not be thinned beyond their specified consistencies to permit more rapid application. The use of inferior cutting agents will not be permitted.

Where specified, metal surfaces are to be given a priming coat of approved primer by Car Builder. Car Builder, if he so elects, may arrange with manufacturer of truck side frames, bolsters, brake beams, side and end ladders, etc., for the application of the priming coat at manufacturer's plant.

When such arrangement is made and where primer is rubbed off, due to handling, surfaces are to be retouched by car builder using approved chromate primer. All rivet heads are to be given a liberal coat of approved primer.

Metal to metal contact surfaces to be given a thick coat of lap joint paint, Spec. PFER 424, ~~lead~~ before parts are assembled.

All clips, brackets, grab irons and other miscellaneous metal parts that are not welded in place are to be dipped in an approved primer before application.

TRUCKS:

All miscellaneous truck parts such as springs, safety supports, etc., are to be dipped in an approved primer before assembly.

All parts of trucks are to be painted, except wheels, axles, and snubbing device with one coat of an approved paint.

UNDERFRAME:

One coat of an approved primer must be applied to top side of sub-floor and to both inside and outside surfaces.

Apply one coat of an approved asphalt emulsion at least 1/8" thick.

When underframes are manufactured at other than the Car Builder's Works, they are to be painted by manufacturer with one coat of an approved primer before shipment to the Car Builder. The Car Builder to apply the asphalt emulsion, as specified above.

BODY:

Apply a priming coat of approved chromate primer to both inside and outside surfaces. The above to be applied by the manufacturer of the steel sides, doors and ends.

For painting inner surface of steel sides, ends and doors, (except engine compartment) see "Insulation".

Exterior of steel side sheets and door sheets are to be given one coat of an approved light orange refrigerator enamel undercoat.

After the application of the light orange refrigerator enamel undercoat, a finish coat of an approved light orange refrigerator enamel is to be applied.

Underframe of car below side sill, including sill steps, to be painted same as side of car.

Priming coat on steel ends shall consist of one coat of approved primer applied by steel end manufacturer, and two coats of asphalt emulsion applied by Car Builder after assembly.

All oil, car cement, asphalt or any other foreign matter accumulated on sides or ends during assembly of car must be cleaned off before application of undercoat.

ROOF:

Exterior surface of metal roof to be given a coat of an approved zinc neutralizer. Apply a coat of an approved galvanized primer over the entire roof surface. Finish coat to be an approved aluminum paint.

For painting underside of roof sheets, see "Insulation".

INSIDE OF CAR:

All visible nails and screw holes must be puttied over.

Lining and bulkhead pad to be given two coats of an approved interior car varnish.

Aluminum ceiling to be unpainted.

Back surface of bulkhead pad to be given a heavy coat of wood sealer before being applied.

DRAIN PAN:

Underside of floor pan is to be given a heavy coat of asphalt material before application.

MACHINE COMPARTMENT:

Machine compartment to be painted with an approved gray enamel.

STENCILING, LETTERING & NUMBERING:

All stenciling, lettering and numbering to be applied in a workmanlike manner taking particular care that paint in letters and figures completely cover and that edges are smooth and clear cut.

All stenciling on ends of car must be done with an asphalt base aluminum paint.

All stenciling on sides of car and roof must be done with an approved black stencil paste.

Location of all stenciling must be in accordance with drawing showing "Lettering" and letters and figures must be in strict accordance with those shown on drawing.

MEDALLIONS:

Medallions to be stenciled on sides of car in accordance with drawings using approved synthetic stencil paste.

WEIGHT:

Each car must be carefully weighed and its individual weight stenciled as shown on drawings.

CAR NUMBERS:

The car numbers must be in accordance with special instructions which will be furnished.

NAME OF CAR BUILDER:

If name of Car Builder is stenciled on cars, it must be located as shown on drawing.

OWNERSHIP PLATE:

Ownership plate or stencil, if specified, to be applied to each side of car as shown on lettering drawing.

CARDBOARDS:

All cardboards to be painted same as exterior of car.

DEFECT CARD HOLDERS:

Defect card holder must not be painted.

LADDERS, HANDHOLDS AND SILL STEPS:

Sill steps, ladders and handholds on sides of car to be painted same as sides of car.

Safety appliances on ends of car to be painted the same color as ends of car.

DOOR FIXTURES:

To be painted same as sides of car.

RECORDS

PHOTOGRAPHS:

Car Builder shall keep a complete photographic record of the entire construction of the equipment to fully illustrate the manner of assembly, framing, and the application of equipment, including trucks.

PHOTOGRAPHS:(Cont'd)

Upon completion of the equipment, sufficient photographs shall be taken to fully illustrate the manner of assembly, framing, and the application of equipment, including trucks.

Upon completion of the equipment, sufficient photographs shall be taken to fully illustrate the appearance of the interior and exterior of the cars.

Car Builder to furnish the Railroad Company with twelve (12) complete sets of all above photographs.

PATTERNS:

Patterns especially constructed for this equipment, and the cost of which is included in base price, are to become the property of the Railroad Company upon completion of equipment.

PACIFIC FRUIT EXPRESS COMPANY

SPECIFICATION FOR LUMBER
USED IN CONSTRUCTION OF
80,000 LB. CAPACITY STEEL SHEATHED WOOD LINED MECHANICAL REFRIGERATOR CAR
CLASS R-40-30

All lumber to be equal to or better than requirements specified in paragraphs referred to in West Coast Lumbermen's Association Grading Rules (Latest Revision) as shown for the various lumber items listed.

W.C.L.A. - PARAGRAPH NO. 301 & 302

Ceiling Moulding

W.C.L.A. - PARAGRAPH NO. 304 & 305

Door Headers

W.C.L.A. - PARAGRAPH NO. 422

Door Stiles

Lining Nailers

W.C.L.A. - PARAGRAPH NO. 424-222

Door Posts

Cardboards

Aux. Door Stiles

Door Threshold Fillers

Floor Stringers

Insulation Cleating

Sub-Lining Nailers

Belt Rails & Furring Rails

Coping Boards

Cripples

Ceiling Nailers

Door Threshold Strips

Door Rails

Carlines

Decking Nailers

W.C.L.A. - PARAGRAPH NO. 452

Decking T&G

Pacific Fruit Express Company
Office of Gen'l. Supt. Car Dept.
San Francisco, California.

P.F.E. SCHEDULE NO. 31
UNDERFRAMES - O. H. STEEL
RAILROAD DESIGN ALL WELDED TYPE
FOR
PACIFIC FRUIT EXPRESS REFRIGERATOR CARS
CLASS R-40-30

GENERAL:

The work covered by the following drawings and specifications consists of the construction of the Railroad Design All Welded Steel Underframe for refrigerator cars and the manufacturer shall furnish all labor and materials necessary to construct a complete underframe, satisfactory to the Pacific Fruit Express Company.

DRAWINGS:

The following drawings apply to alternate design underframes. Vendors may submit quotations on any or all alternate designs. It is intended that these drawings shall enable the manufacturer to prepare necessary detail drawings of the design selected. The manufacturer must furnish for approval to the Pacific Fruit Express, duplicate blueprints of all arrangement and detail drawings before proceeding with fabrication.

444-4340	Underframe Arrangement
444-4341	Underframe Arrangement - Alternate
444-4342	Underframe Arrangement - Alternate

MATERIAL SPECIFICATIONS:

Material for these underframes must be furnished by the manufacturer in accordance with the latest revision of the following Material Specifications for various classes of material to be used in assembling underframes:

Grade B Structural Steel Plates, Shapes and Bars, AAR M-116
Grade C Pressed Steel Plates, AAR M-116
Rivet Steel and Rivets, AAR Spec. M-116
Mild Steel Bars, AAR Spec. M-116
Steel Castings, Grade B, AAR Spec. M-201
Chromate Primer, P.F.E. Spec. 400
Approved Welding Rod

PATENTS AND ROYALTIES:

The manufacturer must guarantee the Pacific Fruit Express Company against loss through suits, royalties, or claims of any kind whatsoever on patented articles or materials furnished by the builder, unless otherwise specified.

WELDING:

Welding shall be done by the fusion process and conform to the A.S.T.M. and A.A.R. welding codes.

WELDING: (Cont'd)

Coated rod, which will not air-harden, shall be used for filler metal. The edges and surfaces to be joined together shall be accurately cut to size and form and shall be cleaned of all oil, grease, paint, scale and rust, for a distance of not less than 1/2" from the welding edge.

All slag and flux remaining on any bead of welding shall be removed before laying down the next successive bead. Any cracks or blow holes, that appear on the surface of the bead of welding, shall be removed by chipping or grinding before depositing the next successive bead of welding.

Peening of welds will be permitted only where authorized by Pacific Fruit Express Company's inspector and done under his supervision.

Where welding is done on the underside of the welding groove, prior to welding second side of the groove, all oxidized metal that has dripped through shall be removed and the groove shall be chipped or machined to permit complete penetration of the welding applied to the second side.

All welding in underframe construction must be performed by certified welders.

All slag or flux to be removed with steel brush or approved equivalent method before painting.

PUNCHING, REAMING, BORING, AND COPING:

Rivet holes on all three-ply work shall be punched to a diameter 1/8" smaller on the die side than the finished diameter of the hole, and shall be afterwards reamed to a diameter 1/16" larger than that of the cold rivet.

Full size punched holes shall be 1/16" larger than the nominal diameter of the rivets. The diameter of the die shall not exceed the diameter of the punch by more than 3/32". Holes must be clean cut, without torn or ragged edges. Poor matching of holes may be cause for rejection.

Reaming shall be done after the pieces forming a built-up member are assembled and so firmly bolted together that the surfaces are in close contact. Before riveting, they shall be taken apart, if necessary, and any shavings removed.

Reamed holes shall be cylindrical, perpendicular to the member, and not more than 3/32" larger than the nominal diameter of the rivets. Reamers preferably shall not be directed by hand.

Drilled holes shall be 1/16" larger than the nominal size of the rivet. Burrs on the outside surfaces shall be removed.

Where coping is required, it shall be done in a neat workmanlike manner, true to dimensions, and burning with an Oxy-Acetylene torch will not be permitted.

RIVETING:

Riveting must be done thoroughly and in a workmanlike manner in every respect. Rivets must be centrally headed and tightly driven and entirely fill the holes.

Rivets must be in accordance with A.A.R. Specification M-110 and of sizes as shown on drawings.

Rivet holes through center sills and for parts riveted to center sills must be punched to exact size of rivet and reamed 1/16" larger than the diameter of the rivet except where otherwise specified on drawings. The holes must register and rivets must have full bearing through each part. All other rivet holes in car must register and have full bearing all around for the rivet.

All rivets to be driven by machine wherever possible.

If necessary to ream the holes more than 1/16" larger, the size of rivets must be increased proportionately.

Flanging of sheets must be true to shape and provide close contact with contiguous parts.

The use of drift pins more than 1/16" larger in diameter than rivets will not be permitted. All parts must be securely and tightly clamped together before riveting and in no case shall the rivets be depended upon to draw the parts together. Rivets after they are driven shall entirely fill the holes and shall have heads of the proper shape fitting tightly against the sheets or castings.

SHEARING:

All sections are to be neatly sheared and true to dimensions.

Cutting with a torch will not be permitted unless all surface and edge roughness caused by the torch is removed and the cut edges are planed smooth.

CENTER SILLS:

Center sills to be built up to two A.A.R. sections Z-26 of O.H. steel, total area 24.24" - 82.4 lbs. with inner edges of top horizontal flanges joined together the full length by welding, forming a unit sill which extends full length of car.

Weld penetration must be 100% for a distance of 48" at each bolster, 8" at each crossbearer and 12" from each end. For the remaining length penetration must not be less than 30%.

CENTER SILL - ALTERNATE:

Center sill for design underframe shown on Drwg. No. 444-4342 shall be made up of two 25# channels joined by a 3/8" top cover plate and reinforced at the bottom flange to form a balanced section. Sill to be assembled by automatic welding as shown on drawing.

END CASTINGS:

End castings for alternate design underframe shown on Drwg. No. 444-4341 shall be cast steel grade B to A.A.R. Spec. M-201. Casting shall include body bolster, draft sill, striker, draft lugs, body side bearings, center plate and bolster center filler. Suitable provision is to be made for securement of center sill, side sills and end sill as shown on drawings.

*BODY BOLSTERS:

To be all welded O.H. steel consisting of 3/8" top and bottom pressed steel pans with flanges on sides butt welded together extending between center and side sills. A 3/8" x 3'-0" x 6'-0" plate is to be applied across center sill and top of bolster, welded to center sill and top bolster pans as shown on drawing. A 3/8" x 3'-7-1/2" O.H. steel plate is to be applied across under side of center sill and body bolster and welded as shown on drawing.

CROSSBEARERS:

All welded O.H. steel consisting of 5/16" pressed steel diaphragms welded together. Suitable tie straps with 1-1/2" x 1-1/2" x 1/4" spacer angles to be provided at center sill welded to crossbearer bottom members and center sill as shown on drawings.

CROSSTIES:

Six per car 5" - 6.7 pound O.H. rolled steel channels and four 3/8" pressed wing channels extending between center sill and side sills to be welded to center sill and to side sill channel. A 5/16" x 3" tie strap is to be welded to bottom flanges of center sills at each crosstie as shown on drawing.

DIAGONAL BRACES:

Diagonal braces, two per car, 8" by 11.5# channel, to be welded to side and end sill and to bolster cover plate when shown on drawing.

END SILL REINFORCEMENT:

To be 4" x 3-1/2" x 5/16" to extend from side sill to center sill and welded as shown on drawing.

*STRIKERS:

To be of all welded type with forged front draft lugs and to be provided for application of adjustable coupler centering device.

*To be an integral part of the end casting in design shown on Drwg. No. 444-4341.

****BODY CENTER PLATES:**

Drop forged, A.A.R. Contour, Specification AAR-M-126. Upper and lower surfaces to be parallel to a tolerance of plus or minus 1/32". The upper surface of body center plate and the lower surface of the bolster center filler are to be true and these parts are to be riveted and welded together in such a manner that surfaces fit evenly with good bearing.

****BODY SIDE BEARINGS:**

To be of 3/8" plate welded to body bolster properly reinforced and provided with drop forged steel wear plate.

****BODY BOLSTER CENTER FILLER:**

Cast steel, Grade B, A.A.R. 1941 Design, with rear draft lugs cast integral, hot die pressed, or manufacturer's built up welded design as may be specified.

AB BRAKE SUPPORTS & BRACKETS:

Supports and brackets for securing brake equipment and brake slack adjuster must be furnished and applied by underframe manufacturer.

ASSEMBLING:

The underframe is to be assembled square and true and no underframe will be accepted which is warped or out of square or which is not true to the general dimensions as shown on the plans.

WORKMANSHIP:

All workmanship throughout must be of the best and satisfactory to the Pacific Fruit Express Company.

Rolled material, before being laid off or worked, must be straight. If straightening or flattening is necessary, it shall be done by methods that will not injure the material. Sharp kinks and bends may be cause for rejection.

INSPECTION:

Underframes furnished by manufacturer under these plans and specifications are to be inspected at the builder's works before shipment by a representative of the Pacific Fruit Express Company, or such authorized inspection bureaus as they may see fit to appoint.

Manufacturer shall furnish Pacific Fruit Express Company, or authorized inspector, mill test reports showing quality of rolled steel and steel castings used in fabricating these underframes.

Manufacturer shall furnish for approval by Pacific Fruit Express Company list showing type and make of welding rod to be used in the fabrication of these underframes.

****To be cast integral with end castings in design shown on Drwg. No. 444-4341.**

INSPECTION: (Cont'd)

Manufacturer must furnish the Pacific Fruit Express Company with one copy of each order covering purchase of steel plates, shapes, steel castings, rivets, and paint to be used in the fabrication of these underframes.

PAINTING:

Underframe must be thoroughly cleaned and free from rust, grease, and mill scale before painting.

Apply a priming coat of an approved chromate primer to both inside and outside surfaces. This coat may be brushed or sprayed on. Paint should be allowed 24 hours for drying.

COMPOSITION:

One underframe as furnished by the manufacturer shall consist of the following parts manufactured and assembled as shown on drawings:

<u>ITEM</u>	<u>UNITS PER CAR</u>
End Casting (Drwg. No. 444-4341 only)	2
Cylinder Support Bracket on Crosstie	1
Reservoir Support on Crossbearer	1
Reservoir Support on Crosstie	1
Retainer Pipe Clamp Support	2
Retainer Pipe Clamp Support	1
Cylinder Support	2
AB - Valve Support Angle	1
Branch Pipe Tee Support	1
AB Valve Support Angle on Crossbearer	1
AB Valve Support Angle on Crosstie	1
Cylinder Support on Crossbearer	1
Center Sill - Complete	1
Center Sill Tie at Crosstie	5
Center Sill Separator Angle	4
Center Sill Tie at Crossbearer	2
*Body Side Bearing Shim	4
*Side Bearing Wear Plate (Drop Forged)	4
*Bolster End Stiffener	4
End Sill Angle Cock Holder	2
*Bolster Top Section	4
*Bolster Bottom Section	4
*Bolster Vertical Reinforcement - Side	4
*Side Bearing Support	4
*Bolster Top Cover	2
Brake Rod Supports	2
Brake Lever Guides	4
Bell Crank Fulcrum	1
Hand Brake Rod Guide	2
Crosstie	10
*Striker Plate	2
*Striker Plate Backer	2
*Pocket Top & Back Plate	4
*Pocket Front Plate	4

<u>ITEM</u>	<u>UNITS PER CAR</u>
**Trunnion Pocket Support Lug	8
*Body Center Plate	2
*Front Draft Gear Stop	4
*Bolster Center Filler	2
End Sill	4
Corner Connection	4
Corner Connection Plate	8
Diagonal Brace (when shown on drawing)	4
*Bolster Bottom Cover Plate	2
Diagonal Brace Gusset (when shown on drawing)	8
Fuel Tank Support	6
End Sill Angle	1
Deck Plate	1

*To be cast integral with end casting in design shown on Drwg. No. 444-4341.

**Furnished by Car Builder and applied by underframe manufacturer.

Office of Gen. Supt. Car Department,
San Francisco, California.
August 19, 1957.

P.F.E. SCHEDULE NO. 31
UNDERFRAMES - O. H. STEEL
RAILROAD DESIGN ALL WELDED TYPE
FOR
PACIFIC FRUIT EXPRESS REFRIGERATOR CARS
CLASS R-40-30

GENERAL:

The work covered by the following drawings and specifications consists of the construction of the Railroad Design All Welded Steel Underframe for refrigerator cars and the manufacturer shall furnish all labor and materials necessary to construct a complete underframe, satisfactory to the Pacific Fruit Express Company.

DRAWINGS:

The following drawings apply to alternate design underframes. Vendors may submit quotations on any or all alternate designs. It is intended that these drawings shall enable the manufacturer to prepare necessary detail drawings of the design selected. The manufacturer must furnish for approval to the Pacific Fruit Express, duplicate blueprints of all arrangement and detail drawings before proceeding with fabrication.

444-4340	Underframe Arrangement
444-4341	Underframe Arrangement - Alternate
444-4342	Underframe Arrangement - Alternate

MATERIAL SPECIFICATIONS:

Material for these underframes must be furnished by the manufacturer in accordance with the latest revision of the following Material Specifications for various classes of material to be used in assembling underframes:

Grade B Structural Steel Plates, Shapes and Bars, AAR M-116
Grade C Pressed Steel Plates, AAR M-116
Rivet Steel and Rivets, AAR Spec. M-116
Mild Steel Bars, AAR Spec. M-116
Steel Castings, Grade B, AAR Spec. M-201
Chromate Primer, P.F.E. Spec. 400
Approved Welding Rod

PATENTS AND ROYALTIES:

The manufacturer must guarantee the Pacific Fruit Express Company against loss through suits, royalties, or claims of any kind whatsoever on patented articles or materials furnished by the builder, unless otherwise specified.

WELDING:

Welding shall be done by the fusion process and conform to the A.S.T.M. and A.A.R. welding codes.

WELDING: (Cont'd)

Coated rod, which will not air-harden, shall be used for filler metal. The edges and surfaces to be joined together shall be accurately cut to size and form and shall be cleaned of all oil, grease, paint, scale and rust, for a distance of not less than 1/2" from the welding edge.

All slag and flux remaining on any bead of welding shall be removed before laying down the next successive bead. Any cracks or blow holes, that appear on the surface of the bead of welding, shall be removed by chipping or grinding before depositing the next successive bead of welding.

Peening of welds will be permitted only where authorized by Pacific Fruit Express Company's inspector and done under his supervision.

Where welding is done on the underside of the welding groove, prior to welding second side of the groove, all oxidized metal that has dripped through shall be removed and the groove shall be chipped or machined to permit complete penetration of the welding applied to the second side.

All welding in underframe construction must be performed by certified welders.

All slag or flux to be removed with steel brush or approved equivalent method before painting.

PUNCHING, REAMING, BORING, AND COPING:

Rivet holes on all three-ply work shall be punched to a diameter 1/8" smaller on the die side than the finished diameter of the hole, and shall be afterwards reamed to a diameter 1/16" larger than that of the cold rivet.

Full size punched holes shall be 1/16" larger than the nominal diameter of the rivets. The diameter of the die shall not exceed the diameter of the punch by more than 3/32". Holes must be clean cut, without torn or ragged edges. Poor matching of holes may be cause for rejection.

Reaming shall be done after the pieces forming a built-up member are assembled and so firmly bolted together that the surfaces are in close contact. Before riveting, they shall be taken apart, if necessary, and any shavings removed.

Reamed holes shall be cylindrical, perpendicular to the member, and not more than 3/32" larger than the nominal diameter of the rivets. Reamers preferably shall not be directed by hand.

Drilled holes shall be 1/16" larger than the nominal size of the rivet. Burrs on the outside surfaces shall be removed.

Where coping is required, it shall be done in a neat workmanlike manner, true to dimensions, and burning with an Oxy-Acetylene torch will not be permitted.

RIVETING:

Riveting must be done thoroughly and in a workmanlike manner in every respect. Rivets must be centrally headed and tightly driven and entirely fill the holes.

Rivets must be in accordance with A.A.R. Specification M-110 and of sizes as shown on drawings.

Rivet holes through center sills and for parts riveted to center sills must be punched to exact size of rivet and reamed $1/16$ " larger than the diameter of the rivet except where otherwise specified on drawings. The holes must register and rivets must have full bearing through each part. All other rivet holes in car must register and have full bearing all around for the rivet.

All rivets to be driven by machine wherever possible.

If necessary to ream the holes more than $1/16$ " larger, the size of rivets must be increased proportionately.

Flanging of sheets must be true to shape and provide close contact with contiguous parts.

The use of drift pins more than $1/16$ " larger in diameter than rivets will not be permitted. All parts must be securely and tightly clamped together before riveting and in no case shall the rivets be depended upon to draw the parts together. Rivets after they are driven shall entirely fill the holes and shall have heads of the proper shape fitting tightly against the sheets or castings.

SHEARING:

All sections are to be neatly sheared and true to dimensions.

Cutting with a torch will not be permitted unless all surface and edge roughness caused by the torch is removed and the cut edges are planed smooth.

CENTER SILLS:

Center sills to be built up to two A.A.R. sections Z-26 of O.H. steel, total area 24.24 " - 82.4 lbs. with inner edges of top horizontal flanges joined together the full length by welding, forming a unit sill which extends full length of car.

Weld penetration must be 100% for a distance of 48 " at each bolster, 8 " at each crossbearer and 12 " from each end. For the remaining length penetration must not be less than 30%.

CENTER SILL - ALTERNATE:

Center sill for design underframe shown on Drwg. No. ~~444~~-4342 shall be made up of two ~~25#~~ channels joined by a $3/8$ " top cover plate and reinforced at the bottom flange to form a balanced section. Sill to be assembled by automatic welding as shown on drawing.

END CASTINGS:

End castings for alternate design underframe shown on Drwg. No. 444-4341 shall be cast steel grade B to A.A.R. Spec. M-201. Casting shall include body bolster, draft sill, striker, draft lugs, body side bearings, center plate and bolster center filler. Suitable provision is to be made for securement of center sill, side sills and end sill as shown on drawings.

*BODY BOLSTERS:

To be all welded O.H. steel consisting of 3/8" top and bottom pressed steel pans with flanges on sides butt welded together extending between center and side sills. A 3/8" x 3'-0" x 6'-0" plate is to be applied across center sill and top of bolster, welded to center sill and top bolster pans as shown on drawing. A 3/8" x 3'-7-1/2" O.H. steel plate is to be applied across under side of center sill and body bolster and welded as shown on drawing.

CROSSBEARERS:

All welded O.H. steel consisting of 5/16" pressed steel diaphragms welded together. Suitable tie straps with 1-1/2" x 1-1/2" x 1/4" spacer angles to be provided at center sill welded to crossbearer bottom members and center sill as shown on drawings.

CROSSTIES:

Six per car 5" - 6.7 pound O.H. rolled steel channels and four 3/8" pressed wing channels extending between center sill and side sills to be welded to center sill and to side sill channel. A 5/16" x 3" tie strap is to be welded to bottom flanges of center sills at each crosstie as shown on drawing.

DIAGONAL BRACES:

Diagonal braces, two per car, 8" by 11.5# channel, to be welded to side and end sill and to bolster cover plate when shown on drawing.

END SILL REINFORCEMENT:

To be 4" x 3-1/2" x 5/16" to extend from side sill to center sill and welded as shown on drawing.

*STRIKERS:

To be of all welded type with forged front draft lugs and to be provided for application of adjustable coupler centering device.

*To be an integral part of the end casting in design shown on Drwg. No. 444-4341.

* BODY CENTER PLATES:

Drop forged, A.A.R. Contour, Specification AAR-M-126. Upper and lower surfaces to be parallel to a tolerance of plus or minus 1/32". The upper surface of body center plate and the lower surface of the bolster center filler are to be true and these parts are to be riveted and welded together in such a manner that surfaces fit evenly with good bearing.

* BODY SIDE BEARINGS:

To be of 3/8" plate welded to body bolster properly reinforced and provided with drop forged steel wear plate.

* BODY BOLSTER CENTER FILLER:

Cast steel, Grade B, A.A.R. 1941 Design, with rear draft lugs cast integral, hot die pressed, or manufacturer's built up welded design as may be specified.

AB BRAKE SUPPORTS & BRACKETS:

Supports and brackets for securing brake equipment and brake slack adjuster must be furnished and applied by underframe manufacturer.

ASSEMBLING:

The underframe is to be assembled square and true and no underframe will be accepted which is warped or out of square or which is not true to the general dimensions as shown on the plans.

WORKMANSHIP:

All workmanship throughout must be of the best and satisfactory to the Pacific Fruit Express Company.

Rolled material, before being laid off or worked, must be straight. If straightening or flattening is necessary, it shall be done by methods that will not injure the material. Sharp kinks and bends may be cause for rejection.

INSPECTION:

Underframes furnished by manufacturer under these plans and specifications are to be inspected at the builder's works before shipment by a representative of the Pacific Fruit Express Company, or such authorized inspection bureaus as they may see fit to appoint.

Manufacturer shall furnish Pacific Fruit Express Company, or authorized inspector, mill test reports showing quality of rolled steel and steel castings used in fabricating these underframes.

Manufacturer shall furnish for approval by Pacific Fruit Express Company list showing type and make of welding rod to be used in the fabrication of these underframes.

* To be cast integral with end castings in design shown on Drwg. No. 444-4341.

INSPECTION: (Cont'd)

Manufacturer must furnish the Pacific Fruit Express Company with one copy of each order covering purchase of steel plates, shapes, steel castings, rivets, and paint to be used in the fabrication of these underframes.

PAINTING:

Underframe must be thoroughly cleaned and free from rust, grease, and mill scale before painting.

Apply a priming coat of an approved chromate primer to both inside and outside surfaces. This coat may be brushed or sprayed on. Paint should be allowed 24 hours for drying.

COMPOSITION:

One underframe as furnished by the manufacturer shall consist of the following parts manufactured and assembled as shown on drawings:

<u>ITEM</u>	<u>UNITS PER CAR</u>
End Casting (Drwg. No. 444-4341 only)	2
Cylinder Support Bracket on Crosstie	1
Reservoir Support on Crossbearer	1
Reservoir Support on Crosstie	1
Retainer Pipe Clamp Support	2
Retainer Pipe Clamp Support	1
Cylinder Support	2
AB - Valve Support Angle	1
Branch Pipe Tee Support	1
AB Valve Support Angle on Crossbearer	1
AB Valve Support Angle on Crosstie	1
Cylinder Support on Crossbearer	1
Center Sill - Complete	1
Center Sill Tie at Crosstie	5
Center Sill Separator Angle	4
Center Sill Tie at Crossbearer	2
*Body Side Bearing Shim	4
*Side Bearing Wear Plate (Drop Forged)	4
*Bolster End Stiffener	4
End Sill Angle Cock Holder	4
*Bolster Top Section	2
*Bolster Bottom Section	4
*Bolster Vertical Reinforcement - Side	4
*Side Bearing Support	4
*Bolster Top Cover	2
Brake Rod Supports	2
Brake Lever Guides	4
Bell Crank Fulcrum	1
Hand Brake Rod Guide	2
Crosstie	10
*Striker Plate	2
*Striker Plate Backer	2
*Pocket Top & Back Plate	4
*Pocket Front Plate	4

<u>ITEM</u>	<u>UNITS PER CAR</u>
**Trunnion Pocket Support Lug	8
*Body Center Plate	2
*Front Draft Gear Stop	4
*Bolster Center Filler	2
End Sill	4
Corner Connection	4
Corner Connection Plate	8
Diagonal Brace (when shown on drawing)	4
*Bolster Bottom Cover Plate	2
Diagonal Brace Gusset (when shown on drawing)	8
Fuel Tank Support	6
End Sill Angle	1
Deck Plate	1

*To be cast integral with end casting in design shown on Drwg. No. 444-4341.

**Furnished by Car Builder and applied by underframe manufacturer.

Office of Gen. Supt. Car Department,
San Francisco, California.
August 19, 1957.

P.F.E. SCHEDULE NO. RE-2

Refrigeration Unit
For
Pacific Fruit Express Refrigerator Cars

General:

This schedule covers the general description of a refrigeration system designed for installation in Pacific Fruit Express Company's 40-ton capacity refrigerator cars. The car is to be used primarily for handling fresh fruit and vegetables in temperature ranges above 32°F.; however, cars will be used occasionally for frozen foods at 0°.

An engine compartment is provided in one end of car for housing the power plant, condensing unit, etc. The cooling coil and air circulating fans are to be mounted in an air channel surrounding the commodity space as an envelope. Air circulating to the cooling coil will flow through a plenum chamber in the ceiling, down through air channels in the side and end walls, then through a channel under the floor in such a manner that it will be confined to the envelope throughout the complete cycle, not entering the lading compartment. Air circulating devices, furnished by the car builder, are to be installed inside the lading compartment.

It is preferred that the condensing assembly be furnished fully charged with refrigerant. Evaporator assembly should be shipped with a holding charge of refrigerant.

The refrigeration system should preferably be delivered and installed in major sub-assemblies. Sub-assemblies listed below are recommended:

1. Condensing Unit Assembly
2. Evaporator Assembly
3. Evaporator Blower Assembly
4. Electrical Control Panel
5. Refrigerant Control Panel
6. Thermostatic Control.

Sub-assemblies must be accessible and easily removable for repairs.

Exchange of sub-assemblies for preventive maintenance is preferred to exchange of entire unit.

Equipment is to be supported on suitable shock-absorbing mounts designed for railroad freight car use. Flexible wiring and pipe connections must be furnished whenever necessary to prevent damage from shock or vibration.

The air required for cooling the condenser and radiator is introduced and discharged through louvers on each side of the car. The openings will also serve as access openings to the refrigeration system for inspections and servicing.

Electrical controls are to be installed in a dust and drip proof box. Location and mounting to be approved by purchaser. The thermostatic control is to be installed in a separate dust proof box.

Equipment located in the engine compartment must be designed to operate properly when exposed to temperatures of minus 30°F. to 150°F.

Provision must be made for standby operation from an outside power source. (The Pyle-National No. JPLD-116046 plug must be used to match receptacle No. JRL-460 furnished on the power plant.)

All electrical wiring and refrigerant tubing required to complete the installation must be furnished by the vendor who must be prepared to give necessary technical assistance in supervising installation of the unit.

Vendor must furnish for approval detail specifications, including curves showing net refrigeration capacity at a lading compartment temperature of 35°F. and also at 0°F., (with an ambient temperature of 100°F.) together with prints of drawings covering their proposed equipment.

The refrigeration unit supplier must furnish two complete installation and service manuals for each unit, complete with a list of parts for

each component assembly. Pacific Fruit Express Company reserves the right to reproduce the entire manual, drawings or specifications, or any portion thereof.

Condenser Unit Assembly:

The net refrigeration capacity must not be less than 42,000 BTU/Hr. at a lading compartment temperature of 35°F. and must not be less than 15,000 BTU/Hr. at a lading compartment temperature of 0° with an ambient temperature of 100°F. The condensing temperature must not exceed a 14° rise at a 0° lading compartment nor a 24° rise at a 35° lading compartment (with an ambient temperature of 100°F).

The condenser fan must be direct driven.

The condensing unit must not exceed the following dimensions:

Maximum Width = 42"
Maximum Depth = 44".

Cooling Coil Assembly:

The cooling coil is to be located as specified. All metal parts must be made of non-ferrous metal, stainless steel, or be galvanized unless otherwise specified.

Defrosting of the cooling coil, if required, must be fully automatic. The frequency of the defrost cycle must be based on the necessity rather than on a fixed time cycle.

Tube sheets and reinforcing angles for the evaporator assembly must be so designed to serve as bulkhead reinforcements to transmit stresses (from a shifting load) into the car structure.

Evaporator Blower Assembly:

A blower with backward inclined blade wheels is preferred and wheels must be mounted directly on the extended shaft of the motor.

The blower must have sufficient capacity to meet the refrigeration requirements as specified under paragraph 1 "Condensing Unit Assembly".

Air diffusers that may be considered necessary will be supplied by car builder.

The blower motor must be of "drip proof" design. Wheels and wheel housings must be of non-ferrous metal or galvanized.

Electrical Control Panel:

Assembly must be furnished completely wired and must contain all the starters, relays, fuses and timers necessary for satisfactory performance of the refrigeration, defrost and heater systems.

The panel must be enclosed in a NEMA 1A dust-tight enclosure.

All electrical wiring must be color coded and numbered.

Electrical panel enclosure must be equipped with indicator lights; a blue colored lens for the cooling cycle and an amber colored lens for the heating and defrost cycle (Westinghouse transformer type #1577087 or equal).

Refrigerant Control Panel:

Assembly shall consist of the components necessary to assure satisfactory operation of the refrigeration system. Unit to be furnished pre-assembled.

Component parts (such as heat interchanger) that are to be insulated, must be insulated by supplier prior to shipping.

Thermostatic Control:

Thermostat must be accurate to within plus or minus 1° @ 34°F. setting and plus or minus 2° at zero setting.

Thermostat must be calibrated for settings as follows:

<u>32°F. Range</u>	<u>0°F. Range</u>
36° Cooling On	0° Thermostat Setting
35° Heating Off	-1° Cooling On
34° Thermostat Setting	-4° Cooling Off.
33° Cooling Off	
32° Heating On	

Galvanizing:

All metal parts, including bolts, nuts, washers and screws in the evaporator area (except non-ferrous metals or stainless steel) must be galvanized. The galvanizing process must adhere to the A.S.T.M. Specification covering the Electro-Plating of zinc on steel or the A.S.T.M. Standards on Hot-Dip Galvanized Coatings.

Alternates:

Vendors are invited to quote on any combination of equipment which, in their opinion, will provide a better or less expensive method of satisfying the conditions outlined in this schedule. Such proposals must be accompanied by a full description and detailed specifications.

Office of Gen. Supt. Car Dept.,
San Francisco, California,
Dated: June 4, 1957.

P.F.E. SCHEDULE NO. RE-2

Refrigeration Unit
For
Pacific Fruit Express Refrigerator Cars

General:

This schedule covers the general description of a refrigeration system designed for installation in Pacific Fruit Express Company's 40-ton capacity refrigerator cars. The car is to be used primarily for handling fresh fruit and vegetables in temperatures ranges above 32°F.; however, cars will be used occasionally for frozen foods at 0°.

An engine compartment is provided in one end of car for housing the power plant, condensing unit, etc. The cooling coil and air circulating fans are to be mounted in an air channel surrounding the commodity space as an envelope. Air circulating to the cooling coil will flow through a plenum chamber in the ceiling, down through air channels in the side and end walls, then through a channel under the floor in such a manner that it will be confined to the envelope throughout the complete cycle, not entering the lading compartment. Air circulating devices, furnished by the car builder, are to be installed inside the lading compartment.

It is preferred that the condensing assembly be furnished fully charged with refrigerant. Evaporator assembly should be shipped with a holding charge of refrigerant.

The refrigeration system should preferably be delivered and installed in major sub-assemblies. Sub-assemblies listed below are recommended:

1. Condensing Unit Assembly
2. Evaporator Assembly
3. Evaporator Blower Assembly
4. Electrical Control Panel
5. Refrigerant Control Panel
6. Thermostatic Control..

Sub-assemblies must be accessible and easily removable for repairs.

Exchange of sub-assemblies for preventive maintenance is preferred to exchange of entire unit.

Equipment is to be supported on suitable shock-absorbing mounts designed for railroad freight car use. Flexible wiring and pipe connections must be furnished whenever necessary to prevent damage from shock or vibration.

The air required for cooling the condenser and radiator is introduced and discharged through louvers on each side of the car. The openings will also serve as access openings to the refrigeration system for inspections and servicing.

Electrical controls are to be installed in a dust and drip proof box. Location and mounting to be approved by purchaser. The thermostatic control is to be installed in a separate dust proof box.

Equipment located in the engine compartment must be designed to operate properly when exposed to temperatures of minus 30°F. to 150°F.

Provision must be made for standby operation from an outside power source. (The Pyle-National No. JPLD-116046 plug must be used to match receptacle No. JRL-460 furnished on the power plant.)

All electrical wiring and refrigerant tubing required to complete the installation must be furnished by the vendor who must be prepared to give necessary technical assistance in supervising installation of the unit.

Vendor must furnish for approval detail specifications, including curves showing net refrigeration capacity at a lading compartment temperature of 35°F. and also at 0°F., (with an ambient temperature of 100°F.) together with prints of drawings covering their proposed equipment.

The refrigeration unit supplier must furnish two complete installation and service manuals for each unit, complete with a list of parts for

each component assembly. Pacific Fruit Express Company reserves the right to reproduce the entire manual, drawings or specifications, or any portion thereof.

Condenser Unit Assembly:

The net refrigeration capacity must not be less than 42,000 BTU/Hr. at a lading compartment temperature of 35°F. and must not be less than 15,000 BTU/Hr. at a lading compartment temperature of 0° with an ambient temperature of 100°F. The condensing temperature must not exceed a 14° rise at a 0° lading compartment nor a 24° rise at a 35° lading compartment (with an ambient temperature of 100°F).

The condenser fan must be direct driven.

The condensing unit must not exceed the following dimensions:

Maximum Width = 42"
Maximum Depth = 44".

Cooling Coil Assembly:

The cooling coil is to be located as specified. All metal parts must be made of non-ferrous metal, stainless steel, or be galvanized unless otherwise specified.

Defrosting of the cooling coil, if required, must be fully automatic. The frequency of the defrost cycle must be based on the necessity rather than on a fixed time cycle.

Tube sheets and reinforcing angles for the evaporator assembly must be so designed to serve as bulkhead reinforcements to transmit stresses (from a shifting load) into the car structure.

Evaporator Blower Assembly:

A blower with backward inclined blade wheels is preferred and wheels must be mounted directly on the extended shaft of the motor.

The blower must have sufficient capacity to meet the refrigeration requirements as specified under paragraph 1 "Condensing Unit Assembly."

Air diffusers that may be considered necessary will be supplied by car builder.

The blower motor must be of "drip proof" design. Wheels and wheel housings must be of non-ferrous metal or galvanized.

Electrical Control Panel:

Assembly must be furnished completely wired and must contain all the starters, relays, fuses and timers necessary for satisfactory performance of the refrigeration, defrost and heater systems.

The panel must be enclosed in a NEMA 1A dust-tight enclosure.

All electrical wiring must be color coded and numbered.

Electrical panel enclosure must be equipped with indicator lights; a blue colored lens for the cooling cycle and an amber colored lens for the heating and defrost cycle (Westinghouse transformer type #1577087 or equal).

Refrigerant Control Panel:

Assembly shall consist of the components necessary to assure satisfactory operation of the refrigeration system. Unit to be furnished pre-assembled.

Component parts (such as heat interchanger) that are to be insulated, must be insulated by supplier prior to shipping.

Thermostatic Control:

Thermostat must be accurate to within plus or minus 1° @ 34 F. setting and plus or minus 2° at zero setting.